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WA7B3

**"Intelligent Product System" To Replace "Waste Management"**.  
Dr. B. Jungart, EPEA-Environmental Institute, Hamburg, Germany; J. Englefranz, ditto

A concept proposal was developed by EPEA for transforming the current regime of waste management to an economically and environmentally sustainable system of intelligent products using the Federal State of Baden-Wuerttemberg as an example.

For the proposed concept products were divided into three categories: 1. Consumption products, 2. Service products, 3. Unmarketable products...

For each of these product categories, specific criteria for production and disposal have been developed.

This concept would be a new approach to present economic system, changing from a supply and demand to a "life-cycle" economic system, to ensure sustainable development.

WA7B5

**Uncertainty Factors In Ecological Risk Assessment**. E. Calabrese, L.A. Baldwin, Environmental Health Sciences Program, University of Massachusetts, Amherst, MA USA.

Ecological risk assessment must deal with a wide range of uncertainties such as acute to chronic extrapolation, life stage extrapolation, interspecies uncertainty, extrapolation from species-specific data to ecosystems and multiple chemical exposures. Uncertainty factors (UFs) are usually dealt with in a generic fashion such as the use of factors of 10 for multiple UFs in human risk assessment for non-carcinogens. However, in the case of ecological risk assessment no such codification exists. Evaluation of previous risk assessment literature and comparison with current mammalian risk assessment procedures provides the basis not only for a proposed generic codification, but also for how a "tailored" UF could be derived for a particular species depending on the quality and quantity of the database.

WA7B4

**The Role Of Risk Assessment Throughout The Superfund RI/FS Process**. C.E. Marcussen and V.B. Mylavarapu, Ph.D. Environmental Science and Engineering, Inc. Gainesville, FL USA

Since 1986, risk assessment (RA) has become recognized as a valuable tool to determine the relative significance of chemical spills/releases at hazardous waste sites regulated under Superfund. RA is used to screen sites prior to National Priority Listing (NPL) of a site, and once listed, RA is required as part of the remedial investigation/feasibility study (RI/FS) process to evaluate the potential health risks and impacts associated with exposure to the site. Past experience has proven the beneficial use of RA in scoping the RI/FS; developing workplans and sampling/analysis plans, deriving health-based cleanup goals, and for determining if these goals have been achieved during post-RI/FS evaluations. While use of RA has been recommended since 1986, not until 1991 have they been formally recognized, as reflected in the establishment of regulatory guidance specifying the role of RA throughout the RI/FS process. These RA applications assist in characterizing and responding to chemical releases, and reduces the level of uncertainty associated with solving hazardous waste control problems.

WA7B6

**Use Of Exposure-Response Bioassays On *Arbacia punctulata* For The Determination Of Ecological Risk**. C. Mueller, B. Rogers, P. Comeleo, S. Jayaraman, W. Munns, Jr., SAIC, and W. Nelson, EPA, Narragansett, RI USA; and R. Johnston, NCCOSC, San Diego, CA USA.

Two sea urchin exposure-response bioassays were conducted to develop a marine ecological risk assessment (ERA) model and to determine the effects of hazardous waste disposal at the Naval Construction Battalion Center (NCBC), Davisville, RI on the adjacent Allen Harbor and Narragansett Bay. *Arbacia* gametes and embryos were exposed for 20 min and 48 hr to serial dilutions of landfill-associated sediment extracts and seep water samples to evaluate the effects of this disposal site on marine organisms. Successful fertilizations, normal and abnormal embryonic development, and 48 hr mortality were examined. Positive exposure-related responses were observed for both seep samples and sediment extracts. These models will be used to define current ecological risks to organisms representative of those in Allen Harbor.

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